THE TECH

VOL. XXXIV. No. 84. BOSTON, MASS., WEDNESDAY, JANUARY 20, 1915. PRICE THREE CENTS

FINAL RELAY TRIALS FOR HARVARD MEET

Selection For Fourth Place Not Yet Decided—Close Race Is Predicted.

Final trials for the relay team which will meet Harvard at the Coast Artillery games have been held, and the squad has been cut to six men. Guething, Reid, Colleary, O'Hara, Brock and Dean have been retained and the team to run Saturday night will be selected from these men. Guething, Colleary and Reid are sure of running, but the fourth place is still in doubt.

Brock, Dean and O'Hara were all very close in times in the trials, and Coach Kanaly is not yet willing to announce his final choice. Although Brock was two-fifths of a second faster for the distance in his trial. it is thought that O'Hara will be the final choice for the place. Owing to a death in his family the old B. A. A. star was unable to do any running during the fall and has been slow getting into condition. He has come

(Continued on Page Five)

MR. CARB OFF TO WAR

Institute Instructor To Join Ambulance Corps.

Mr. David Carb of the Institute English Department has been given a half year's leave of absence, and is planning to go directly to the European battlefields. Mr. Carb will act there in connection with the American Ambulance Corps. He is looking forward eagerly to the novel experiences of the theatre of war, and will have an unusual opportunity to obtain dramatic material.

Mr. Carb came to the Institute after his graduation from Harvard, where he was given his A.B. degree. At the Institute he has won great popularity among the student body, as well as considerable reputation as a dramatic critic. He has written several plays.

SENIORS

Appointments for Senior Portfolio pictures must be made immediately. It is impossible for the committee to consult each individual in the short space of time that remains, so every man who has not had a sitting and who considers himself in the Class of 1915, is requested to get an appointment from C. W. Wood, W. B. Spencer or C. M. Runels in the Union, Wednesday or Thursday between 1.30 and 2.00.

There is absolutely no charge for sitting and the actual taking of the picture does not require over ten minutes. Four hundred pictures have to be taken and everybody cannot be last.

TECH SHOW TO START WITH FREE SMOKER

New Coach, Mr. Samuel Hume, To Be Principle Speaker.

Work in the stage department of the Tech Show is to be started in a new way this year. On the first Wednesday evening of next term a smoker will be held which will be free to every undergraduate who expects to come out for the Show.

CARUTHERS A. COLEMAN,
Stage Manager of Tech Show

The new coach, Mr. Samuel Hume, will be present at the smoker, and will tell the men what is expected of the candidates for the cast, the chorus and the ballet. Mr. Hume has travelled extensively and has worked with many of the leaders in the dramatic art. He is expected to accomplish great things this year.

The Stage Manager, Caruthers A. Coleman, and the Stage Director, Rus

(Continued on Page Two)

COMMITTEE MEETING

An important meeting of the Executive Committee of the Senior Class will be held in the Union today at 1.30 p. m. The agreement between Technique 1916 and the Class, concerning the publication of the Senior Portfolio, will be taken up at this time.

GYM TEAM MEETING

There will be an important meeting of the Gym team at 5 p. m. today to elect a permanent captain and manager.

BASKETBALL

Candidates for Assistant Manager of the basketball team will report at the Gym this afternoon at four o'clock.

OFFICERS CLUB WILL CONDUCT BIG DANCE

Cadet Corps' Annual Celebration Comes In First Week Of Term.

The annual Military Hop held by the Officers' Club will take place this year on Friday evening, February 12. The event will be from 8 until 12 in Horticultural Hall. Plans have been made to make the dance an all Technology affair. Tickets may be obtained at the Cage or from any of the cadet officers at the rate of $1.25 each.

The dance program is as follows:

1. One step, Rag Picker
2. Fox Trot, Reuben Fox Trot
3. One Step, 2nd Connecticut March
4. Waltz, La Gitane
5. One Step, Michigan
6. One Step, Poor Pauline
7. Waltz, Sari
8. Fox Trot, Ballin' the Jack
9. One Step, I'm Glad My Wife's in Europe
10. Waltz, Over the Waves
    Intermission.
11. One Step, It's a Long Way to Tipperary

(Continued on Page Two)

BASKETBALL SCHEDULE

Many Advantageous Games Secured—Some Long Trips.

The schedule of the basketball team has been completed and is as follows:

January 30—St. Lawrence University, Canton, N. Y.

February 1—Clarkson College of Technology, Potsdam, N. Y.

February 4—Trinity, Hartford Conn.

February 6—Wesleyan University, Middletown, Conn.

February 12—Penn. State, Lamonte Penn.

February 13—Lehigh University. South Bethlehem, Penn.

February 17—R. I. State, Kingston, R. I.

February 20—Connecticut Aggies, Durham, N. Y.

February 27—N. H. State College, Tech Gym.

March 6—College of the City of New York, New York City.

March 13—Connecticut Aggies, Storrs, Conn.

Although this schedule is a very hard one, the coach expects the team to come through the series creditably.

RELAY TEAM

There will be a meeting of the members of the 1917 relay team in 27 Rogers at 1 p. m. The question about sweaters is to be discussed.

EXTENSIVE SCHEDULE FOR MUSICAL CLUBS

Receptions And Dances Are To Be Given In Many Of The Cities Visited.

The last extensive trip taken by the Musical Clubs was in 1910, since which time a similar trip has not been undertaken. The management has attempted the present trip largely because of the fact that sufficient interest and incentive are lacking in the schedule of the Clubs when only local concerts are given. The proposed trip has been under consideration since last spring and during the intervening months it has been considered from every viewpoint and nothing has been overlooked which might detract from its success.

The schedule is as follows:

(Continued on Page Five)

FINANCE COMMITTEE

Finances Of Activities Are In Good Condition.

At a meeting of the Finance Committee last week the reports of the treasurers from the various activities at the Institute were heard and all the finances with but few exceptions were in excellent condition. The class treasurers reported that many members of the respective classes had not paid dues up to date. A motion was next passed that the Finance Committee recommend to the Institute Committee that it investigate the condition and activity of the Chem-

(Continued on Page Six)

TECHNIQUE ELECTIONS

B. N. Stimets, '16, was elected first assistant business manager of Technique and C. M. Makepeace, '16, second assistant business manager at a meeting last Friday. Stimets was a member of the 1916 Tug of War Team, a member of the Glee Club for two years, is Assistant Institute Editor of The Tech, and was in the Show in 1914. Makepeace was a member of the 1916 Tug of War Team, second assistant business manager of Tech Show 1914, and a member of the Class Electoral Committee last year.

CALENDAR

Wednesday, January 20, 1915.

1.00—1917 Relay Team. 27 Rogers.

1.10—1918 Football Team. Notman's.

1.30—Executive Committee. Union.

2.00—1917 Crew Picture. Notman's.

4.00—Candidates for Assistant Manager of Basketball Team. Gym.

5.00—Gym Team Meeting. Gym.

Thursday, January 21, 1915.

1.00—Meeting for E. E. Trip. E. E. Library.

THE TECH

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Office, 42 Trinity Place.
Phone—Back Bay 5527 or 2180.
Night Phone—Back Bay 5527.

WEDNESDAY, JANUARY 20, 1915.

IN CHARGE OF THIS ISSUE.

Editor: J. M. DeBell, '17.

Assistants: K. M. Lane, '17; A. R. Brooks, '17; J. W. Damon, '18.

Frequent complaints are heard among Tech men of the way in which they are overworked. Most of these are not worth serious consideration, but one case occurring at the present time seems to indicate a lack of consideration on the part of those in authority for the demands on a student's time made by his other courses.

The Seniors of Courses VI and X have, in addition to their regular work, a report on the recently completed boiler plant test to write up. This requires, on an average, including the necessary study of references, five or six hours. The Course VI men have, in addition, two problems to hand in, which will occupy the average student eight to ten hours, but for which the men are excused from two hours of classroom work. All this comes at a time when a large part of each man's time should be devoted to preparation for exams.

No doubt if the Tech man were designed for one hundred percent efficiency this would be all right. The courses in question have not been requiring the full quota of time and, if advantage had been taken of this fact to get ahead of the game in other courses, these heavy demands could be met. Also if each man did his work as he should throughout the term, no one would need to study for exams. Since, however, this ideal condition is so far removed from actuality, we think more consideration should be shown for the student's human shortcomings.

REGISTRATION

Registration for the second term will begin the middle or latter part of next week.

COLLEGE NEWS

Unikichi Hattori, professor of the College of Literature in the Tokio Imperial University, has been designated as the next Japanese lecturer at Harvard University. Professor Hattori has held many high educational posts and at one time was engaged by the Chinese government as professor of the normal course in Pekin University. He is a famous scholar in Chinese classics.

Washington University announces the establishment of a course in public utilities, which will deal especially with the subject of their valuation for the purpose in rate-making and will be open to the students in engineering and economics. The work is in charge of Mr. J. E. Allison, formerly a member of the St. Louis Public Service Commission, who, both in this capacity and as a consulting engineer, has had much experience in valuing public utility plants. A fund has been donated to the University, the proceeds of which are to be awarded for the competition among the students who will pursue original investigation in the subject of public utilities under the direction of the department of economics.

An exhibition of craft work by the students has been sent to California to be installed in the Educational Building of the Panama-Pacific Exposition.

A summary of the first comprehensive report of the work of the General Education Board shows that through funds given by John D. Rockefeller and through the Board's efforts in inducing others to give, a total of $117,362,710 has been dedicated to the cause of education in the United States, since the organization of the Board twelve years ago.

SHOW SMOKER

(Continued from Page One)

sell H. White, will explain the details of the competitions. These and others connected with the production of the Show will be prepared to answer questions about the work and the trips.

On the Friday following the smoker the first call for candidates will be issued. Because of the smoker, the men will be expected to know just which department they wish to try for, and no time will be lost in starting the actual trials.

The first rehearsal of the Show Orchestra will be held very soon after. The exact date will be announced in The Tech and on posters during the first week of the term.

OFFICERS CLUB

(Continued from Page One)

12. Waltz, Blue Birds
13. Fox Trot, Meadow Brook
14. Waltz, Cecile
15. One Step, You're Here and I'm Here
16. Fox Trot, Old Homestead
17. One Step, Girl From Utah One Step
18. Waltz, Joys of the Dance
19. One Step, Under the Jap. Moon
20. Waltz, Blue Danube

Preliminary orders will be given out at the Cage the latter part of this week.

PHYSICS, CHEMISTRY AND POLYCON EXAMS

Questions Given At Previous Midyears Published Below.

Through the courtesy of the heads of the various departments concerned, we are able to publish below the examinations given last midyears in Political Economy, Junior and Sophomore Physics, and freshman Chemistry:

Political Economy.

1. Define or explain the following terms:
   (a) Free goods.
   (b) Capital.
   (c) Sterling exchange.
   (d) Favorable balance of trade.
   (e) Real wages.
2. Distinguish between productive and unproductive labor, and give an example of each kind.
3. Explain what is meant by the statement that "the maintenance of capital, as well as its creation, involves saving."
4. Give three important advantages of the corporate form of organization.
5. Arrange the following items in their proper order as they would appear in the statement of a national bank. What criticisms would a bank examiner make? Would these criticisms vary if the bank were situated in New York, Boston, or the town of Lexington?

Loans	$340,000
Capital	50,000
Cash	40,000
Real Estate	25,000
Deposits	350,00
Undivided profits	8,000
Notes	65,000
Due from Reserve Agents	40,000
U. S. bonds	60,000
Surplus	32,000

6. Give the three best arguments for a protective tariff, and state how they are answered by the free-trader.
7. Explain the relation between the law of diminishing returns and rent.
8. Assuming that it were possible to assess taxes on land and capital with equal ease and certainty, what reasons can be advanced in favor of the "single tax"?

Physics, Heat.

1. How closely can a temperature of 1000 degrees C. be measured? How accurately is the Centigrade temperature of 1000 degrees known?
2. What is meant by a gas thermometer? Explain fully. Is or is not helium a more suitable gas for filling a standard gas thermometer than carbon dioxide? Give reasons.
3. What is the "cold junction" of a pyrometer, and how does it affect the measurements of temperature?
4. To what in general is the efficiency of heat insulation due? What is the nature of the resistance to fire offered by a tin-clad door?
5. Explain fully one method of measuring (1) the melting point of copper, and (2) the boiling point of liquid air.
6. Describe a method of measuring and computing the co-efficient of cubical expansion of a solid.
7. Explain why solid snow is formed when liquid carbon dioxide in a tank under a pressure of 1000 lbs. per sq. in. and a temperature of 20 degrees C. is allowed to escape freely into the air.
8. Describe the spheroidal state State the laws of fusion.
9. What becomes of the meniscus in the Andrews tubes of carbon dioxide as its temperature is raised from 25 degrees C. to 35 degrees C.?
10. Explain the principle of operation of some freezing machine.

Sophomore Physics.

1. Under what circumstances do uniform motion and uniformly accelerated motion occur? What is simple harmonic motion and how can it be produced?

   State the conditions for equilibrium. What are sympathetic vibrations, and how caused?
2. A picture weighing 28 pounds

(Continued on Page Four)

CONSTRUCTION OF THE CUSTOM HOUSE TOWER

Architects Addressed By Designer And Engineer At Union Last Friday.

The Architectural and Architectural Engineering Societies held a combined smoker in the Union last Friday evening, at which talks were given on the construction of the new Customs House. Mr. W. C. Appleton took up the architectural side. He told how the idea of building on to the old customs house originated in Washington and showed one of the first sketches submitted to the committee in charge. The building weighs twenty-three thousand tons and, since such a large weight rests upon a small area, it was necessary to go down one hundred feet before firm enough ground was reached for foundations, which consist of four cement caissons. The dome of the old building was retained to add to the beauty and Mr. Appleton told about the clock and cupola. The face of the clock is cement and the minutes are cast bronze. Only the tips of the hands are illuminated.

Mr. M. A. Reidy then took up the engineering problems encountered in the construction. He told more in detail about the caissons, pillars, wind stresses and supports over the dome. That the building is now only three-quarters of an inch out of plumb, which for its height is considered very remarkable, was due to the rigid examination of each day's work. The progress made was gone over at the end of the day to see if the building was going up along its intended lines and to see if everything was absolutely right. The smoke stack runs up inside the building into the cupola, which is so high that it affords a very strong draft. There are only three buildings in this country higher than the Customs House, the Woolworth Building and the Metropolitan Tower in New York, and the Smith Building in Seattle. Mr. Reidy considered the building a fine example of modern steel construction and design.

After the talks, blue prints were examined by the students and refreshments were served in the side room.

OLD EXAMS.

(Continued from Page Three)

hangs in the ordinary way by a cord attached to the screw eyes, and passing over a smooth hook. The screw eyes are thirty-six inches apart, and the cord is six feet long. What is the tension in the cord?

Find the center of gravity of a bolt one-half inch in diameter and six inches long under the head; the head is a 1 inch cube.

3. An aeroplane moving at the speed of 75 miles per hour in still air at the height of three thousand feet drops a bomb upon a target. Neglecting air friction, find the horizontal distance between the aeroplane and the target at the moment when the bomb is released. How would air friction modify your answer? Derive the equation of the path of the bomb.

4. The emergency chains in the Panama Canal locks will stop a 10,000-ton vessel moving four miles an hour in a distance of seventy feet; find the average force exerted. If the force were constant, would the speed diminish uniformly, and why?

A waterfall forty feet high supplies 3,600,000 cu. ft. of water every 24 hours. What horsepower does this represent? If the energy were delivered to a railway by an electric plant of 70 per cent efficiency, how many cars requiring fifty kilowatts each could be operated.

5. A gun weighing 8.05 lbs. discharges a bullet weighing 0.0322 lb. with a velocity of 2000 feet per second. How much kinetic energy is imparted to the gun? How much energy had the bullet, and what portion of it remains kinetic energy if the bullet strikes a free body weighing 128.8 lbs.? What becomes of the rest?

6. A kilogram mass attached to a string 1 meter long revolves in a vertical plane with the string as radius. The tension in the string when horizontal is 3 times the weight of the kg. mass. Find the tension when the mass is at the top of its orbit.

7. Write the equations for uniformly accelerated motion and energy of translation that you remember, and the corresponding ones for rotary motion. If a 30-ton flywheel whose radius or gyration is 5.5 feet slows down from 500 to 400 R. P. M. in three seconds, what horsepower does it develop during this interval? If a one hundred pound pull were applied to a rope wound on the circumference of the wheel (diameter 13 ft.), what speed would the wheel acquire in 10 seconds, starting from rest?

8. The mass of the moon is 1-80 of the mass of the earth and the radius 3-11 of that of the earth, how much would a United States standard pound weigh on the moon? If the moon is attracted toward the earth, why is there no collision?

When the atmospheric pressure is one ton per square foot, calculate the height of an oil barometer sp. gr. of oil—0.90.

Why are barometric heights reduced to 0 degrees C.

9. A side-wheel steamship moving north is gradually headed toward the east. Point out any gyrostatic action accompanying the motion. Explain the principle of the gyro compass.

How many vibrations per minute will a pendulum one meter long make? What is a metronome pendulum and what are its advantages, if any? Give all the corrections you know that should be applied to pendulum measurements.

10. Explain why the force and potential inside a closed conductor, electrically charged, are or are not zero. Can a conductor have both plus and minus charges on it and still have all its parts at the same potential? Explain. How would you construct a condenser to have the greatest electrostatic capacity for a given bulk?

Inorganic Chemistry A.

1. State the atomic hypothesis. Give a reason for its general acceptance. State and illustrate the law of combination by volume.

2. Define, in terms of the ionic theory, (a) an acid, (b) a base, and (c) neutralization.

How does the ionic theory explain (d) the constancy of the heat of neutralization of strong acids by strong bases, and (e) the fact that the heat of neutralization is not the same when weak acids and weak bases interact?

3. State what would be observed in each of the following cases, and write reactions to show the ionic changes (if any) involved, (1) when metallic copper is placed in a solution of gold chloride; (2) when copper is placed in hydrochloric acid; (3) when zinc is placed in a solution of copper sulphate; (4) when zinc is placed in a solution of acetic acid.

4. In what essential respect does the catalytic action involved in the "chamber process" for the production of sulphuric acid apparently differ from that involved in the "contact process"?

5. Name a reducing agent by the aid of which sulphur dioxide may be obtained from sulphuric acid; hydrogen sulphide from sulphuric acid. Give reactions in each case, preferably in steps, and show the nature of the oxidation which the reducing agents undergo.

6. Tabulate in columns (1) the names of three acids containing sulphur, (2) their formulas, (3) the valence of sulphur in each acid, (4) the formula of the anhydrides, if any, (5) the ions into which each acid dissociates, (6) the formula of the sodium salt of each acid, (7) the formula of the calcium salt of each acid.

7. What volume of chlorine, saturated with water vapor, and measured at 20 degrees C. and 760 mm., would be used in making 254 kilograms of bleaching powder, according to the following reaction: Calcium hydroxide and Chlorine give Calcium hypochlorite and water.

Atomic weights: Cl. equals 35.5, Ca equals 40, O equals 16. Aqueous tension at 20 degrees equals 17.4 mm. G. M. V. equals 22.4 liters at standard conditions.

8. A solution of a substance X, containing 0.09 gram in 20 cc. of solution, freezes at —0.14 degrees C. The solution does not conduct electricity. What is the molecular weight of X? The molecular lowering of the freezing point of water equals 1.86 degrees C.

9. Knowing that the solubility of

(Continued on Page Five)

OLD EXAMS

(Continued from Page Four)

silver acetate is about 8 grams in a liter of water, while sodium acetate is soluble in less than its own weight of water, predict and explain what would occur if a considerable quantity, say 50 grams, of sodium acetate were dissolved in a liter of a saturated solution of silver acetate.

10. Predict what, if anything, would be observed, and write reactions in each of the following cases: (1) when HI is heated to 400 degrees in a sealed tube; (2) when HCl (gaseous) is heated to 400 degrees in a sealed tube; (3) when perchloric anhydride is added to water; (4) when a mixture of hydrogen chloride gas and air is passed through a tube, heated to 400 degrees and containing clay balls saturated with copper sulphate.

11. How many magnesium nitride be prepared? How does it react with water, and to what type of chemical change does the resulting reaction belong?

Inorganic Chemistry B.

1. Apply the principle of constant proportions and the principle of multiple proportions to the oxides of sulphur.

2. Name experiments which you have performed which illustrate each of three important types of chemical change. Write reactions so far as possible.

3. A tube containing pure carbon is heated, and oxygen is passed through the tube. The resulting carbon dioxide is absorbed by caustic potash. From the following data, calculate a value for the equivalent weight of carbon.

Tube weighs 26 grams. Tube and carbon before heating weigh 23 grams. Tube and residual carbon after heating weigh 21 grams. Potash tube before experiment weighs 35 grams. Potash tube after experiment weighs 42.33 grams.

4. In what important respect does a concentrated solution of a weak acid differ from a dilute solution of a strong acid? Name two ways in which the truth of your answer could be demonstrated.

Describe and explain what occurs when a strip of iron is immersed in a solution of a salt of copper. Can you explain the action of chlorine water upon a solution of sodium iodide upon the same principle? Why or why not?

5. How would you proceed to detect the presence of a small quantity of chlorine gas in hydrogen chloride gas? Write the reaction.

What would you predict as to the intensity of action of fluorine gas upon powdered antimony, and why?

What products would result from the action of hydrogen peroxide upon hydrochloric acid? Write the reaction.

6. If wood alcohol costs 14 cents per kilogram and denatured alcohol costs 10 cents per kilogram, which is the cheaper material to mix with water, to form 20 liters of a solution which will not freeze above —9.3 degrees C.? Molecular weight of wood alcohol is 32, and of denatured alcohol 46 (approximately). Molecular

(Continued on Page Six)

RELAY TRIALS

(Continued from Page One)

along strong the past week and should be running right up to form by Saturday night. He is without any doubt the fastest starter on any relay team in New England, and with fair luck should get the jump on the first man on either the Harvard or Dartmouth teams.

Guething slumped slightly in the first trials over the full distance, but came back strong last Saturday, and will prove fully as good an anchor man as his brother. His time was the fastest of any of the men taking the trial, and his speed, together with his rangy build, will make him one of the strongest relay men in the college ranks.

Colleary and Reid are both big men and just about as fast as the men who ran on last year's team. Colleary is one of the best all round athletes in New England and is a former N. E. I. C. A. A. broad jump champion. He is a strong finisher and will probably be run third man. Reid was a member of the 390 team in 1913, and made second fastest time in the trials.

Harvard will send against Tech practically the same team which set up the world's record of 3 minutes 3 seconds running against the B. A. A quartet at the schoolboy games last year, Barron being the only member of the team lost by graduation. From the present indications, Capper, Bingham, Biddle and Minot will run for the Crimson.

In a trial last week Bingham went through the 390 in 47 seconds, one-fifth faster than the record for the track made by Capper last year. Judging the men by last year's performance, Harvard will have the fastest college relay in the country, but they will be pushed to their limit to beat the team which Technology will send to the mark.

In addition to the Harvard race, the Institute will meet Holy Cross at the Irish-American meet, Dartmouth at the B. A. A. and Georgetown at Hartford. Negotiations are on at present to provide an opponent for Technology in the Providence Armory meet, the best indoor schedule which any management has ever arranged.

MUSICAL CLUBS

(Continued from Page One)

Monday, Feb. 1, at Montclair, N. J.
Tuesday, Feb. 2, at Philadelphia.
Wednesday, Feb. 3, at Washington, Pa.
Thursday, Feb. 4, at Butler, Pa.
Friday, Feb. 5, at Rochester, N. Y.
Saturday, Feb. 6, at Northampton and Springfield.

The men are to be entertained by various alumni and fraternities in the cities visited. At many of the places where concerts are given, dances and receptions are to be held afterwards. On Saturday a concert will be given in the afternoon at Northampton and in the evening at Springfield.

Forty men are to make the trip and a special pullman will be used for at least four days, leaving Boston at 9.15 a. m. on February 1st.

BASKETBALL TRIP

The varsity basketball team is to take a trip during the vacation through northern New York and possibly into Canada. They are to leave the North Station at 11.15 a. m. on Friday, January 29th, arriving at Canton, New York, at 11.45 that night, and putting up at a hotel there until Sunday. On Saturday night they are to play the St. Lawrence University team.

Sunday afternoon they go to Potsdam, New York, where they play the Clarkson College of Technology team. From there they will go either to one of the Canadian universities or directly to Hartford, Conn., where they will play the Trinity team. On Saturday they will play Wesleyan University team at Middletown, Conn., coming home Sunday morning. While in New York over Sunday they will have an opportunity to enjoy some winter sports, as both the places visited are upon the Canadian border.

TECHNOLOGY MONTHLY

Sale Of February Issue To Continue Today.

For the benefit of those who did not get copies of the Technology Monthly yesterday, the issue will be on sale today. They may be obtained at the Cage, at the Monthly office during office hours, or from men who will be through the Institute buildings today.

The next issue of the Monthly is partly ready and will go to press during the mid-year vacation. Contributors of articles for this issue are requested to communicate with the Editors before the end of examination week. Articles may then be arranged for, even though they may not be prepared by that time.

The next issue will appear about a week after the beginning of the second term.

FINANCE COMMITTEE

(Continued from Page One)

ical Engineering Society, Architectural Engineering Society, and Mining Engineering Society.

"Pa" Coburn made his first appearance of the year and briefly outlined the history of the Finance Committee. Mr. Litchfield spoke about the success of the Committee, cautioning all treasurers to make a complete collection of dues.

The next meeting will be held early in February and the following absentees are requested to attend: F. D. Ross, of the Architectural Engineering Society; W. H. Brackett, Electrical Engineering Society; H. J. Lucy, Chemical Engineering Society; H. P. Gray, Hare and Hound Club; W. Shakespeare, Institute Committee, and J. S. McDowell, Mining Engineering Society.

OLD EXAMS

(Continued from Page Five)

lowering of the freezing point of water equals 1.86 degrees C.

7. The density of a gas X is 0.59 as compared with air. What is its molecular weight? (Weight of a liter of air is 1.29 grams and the G. M. V. equals 22.4 liters under standard conditions.)

8. What weight of iron will result from the reduction of 10 grams of ferric oxide, according to the following reaction?

Ferric oxide and hydrogen give water and iron.

What volume of hydrogen measured at 20 degrees C. and 765 mm. will be required for this reaction?

Atomic weights: Fe equals 56, O equals 16, H equals 1. Weight of a liter of hydrogen at standard conditions equals 0.09 gram.

10. What is the essential difference between the catalytic action involved in the "chamber process" for the production of sulphuric acid, and that which you carried out with potassium chlorate and manganese dioxide?